

# — 第966回九大原子核セミナー —

講師： Ying Zhang 氏 (天津大学)

演題： A simple quantum many-body system – neutron drop

日時： 6月26日(金) 15:00～

場所： ( ※ オンラインセミナー)

## 概要

A neutron drop is a system composed only of neutrons trapped by artificial external fields [1]. This simple system can be easily calculated by both the ab initio approach and energy-density functional theory. Therefore, the ab initio solutions for a neutron drop can be used as pseudo-data to calibrate and improve the effective Hamiltonians and density functionals in nuclear physics [2,3]. In this seminar, I will introduce our investigation on neutron drop by using the energy-density functional theories, including the following aspects: the origin of the spin-orbit and pseudospin-orbit splittings' evolution in neutron drop; the pairing [4] and the deformation effects on the neutron drop.

[1] B. S. Pudliner, A. Smerzi, J. Carlson, V. R. Pandharipande, S. C. Pieper, D. G. Ravenhall, Neutron drops and skyrme energy-density functionals, *Phys. Rev. Lett.* 76 (1996) 2416-2419.

[2] S. Gandolfi, J. Carlson, S. C. Pieper, Cold neutrons trapped in external elds, *Phys. Rev. Lett.* 106 (2011) 012501.

[3] S. K. Bogner, R. J. Furnstahl, H. Hergert, M. Kortelainen, P. Maris, M. Stoitsov, J. P. Vary, Testing the density matrix expansion against ab initio calculations of trapped neutron drops, *Phys. Rev. C* 84 (2011) 044306.

[4] Y. H. Ge, Y. Zhang, J. N. Hu, Effects of pairing correlation on neutron drop, *Sci. China Physics, Mech. Astron.* 63 (2020) 242011.

連絡先: 九州大学 理学部 物理学教室 理論核物理研究室  
TEL: 092-802-4101 (内線 8072)  
金 龍熙 (kimu.ryonhi@phys.kyushu-u.ac.jp)

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